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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,195	03/29/2001	Xiao-An Zhang	10010538-1	1230
7590 02/22/2008 HEWLETT-PACKARD COMPANY Intellectual Property Administration P.O. Box 272400 Fort Collins, CO 80527-2400			EXAMINER EVERHART, CARIDAD	
			ART UNIT 2891	PAPER NUMBER
			MAIL DATE 02/22/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/823,195

Applicant(s)

ZHANG ET AL.

Examiner

Caridad M. Everhart

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 20-23 and 40 is/are rejected.
- 7) ☒ Claim(s) 4-19, 24-39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

Response to Arguments

Applicant's arguments have been reviewed and have been found to be not persuasive for the following reasons. Applicant has argued that Swager described a number of different kinds of molecular devices and that the device in figure 26 does not operate by an electric field. This argument is respectfully found not to be persuasive because patents are relevant as prior art for all they contain(MPEP 2123). Therefore, the broad disclosure made by Swager and not only the individual examples are applied to reject the claims. Swager does disclose a teaching that the molecular switch produces a current when placed in an electric field(col. 22, lines 55-59). Applicant has argued that the rejection cites different molecules, and this argument is respectfully found to be not persuasive for the same reason. Applicant has further argued that Swager discloses a polymer and the band gaps taught by Swager are for monomers and not for polymers. This argument is respectfully not found persuasive because the claims recite a molecular switch comprising a molecular system, which would not exclude a polymer. That the mechanism of the conduction is not redox is disclosed by Swager as pointed out in the rejection and in col. 13, lines 10-15, in which Swager discloses that the method may be by conjugation. Although the embodiment shown in Fig. 26 shows a molecular pathway in which there are binding sites, this embodiment is for a detector of analytes(col. 14, lines 53-57 discloses that this is an embodiment of a detector). However, the broader disclosure made by Swager is that rather than a sheet of polymer as in the prior art in which the conductive pathways are not continuous(col. 1, lines 35-

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44), a continuous molecular pathway is provided, of which one embodiment is a detector of an analyte(col. 6, lines 18-27). Therefore, the broad disclosure made by Swager includes that the molecular pathway exposed to an electric field is not necessarily only the molecular pathway of the detector with the analyte example, but the other molecular switch examples given by Swager. The pathway for carrying charge is a molecular system(col. 5, lines 37-48). The molecular system has an extended conjugation(col. 8, lines 3-12) and is a molecular switch(col. 7, lines 14-18). Baker et al (US 2001/0026360A1) is cited but not relied upon for its teaching that the molecules and polymers taught by Swager satisfy the limitations of the instant claims (paragraph 0053).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,2,20,21,22, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Swager(US 7,186,355B2).

Swager discloses a molecular switch in which a molecule is placed between two electrodes(col. 5, lines 7-10 and 38-42). The molecule has a change in conformation or

conjugation from the delocalization of electric charge with extended conjugation(col. 5, lines 43-48 and col. 7, lines 62-67 and col. 21, lines 29-34). The device formed acts as a switch(Abstract). The molecules have change in band gap in an electric field(col. 21, lines 30-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swager as applied to claim 1 above.

Swager is silent with respect to a rotor portion.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the disclosure made by Swager et al encompasses a molecule with a stator and a rotor portion because Fig. 19 and Fig. 20 show molecules which have bonds which have groups which can rotate.

Claims 1-3,20-23, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Tech. Discl NN8902444 Vol 31, No. 9, pages 444-450 in view of Granstrom(US 2003/0112564A1).

The IBM Tech. Discl. Bull. Discloses a molecular switch. The switch is activated by an applied electric field. The change is internal to the molecule and the electron transfer is internal to the molecule(please see the bracketed portion of the reference). In the first line of the reference, it is disclosed that the molecules are useful in logic circuits which are the components in memory devices, so that there is the implication of memory devices. The reference further discloses that there is a transition between initial and final states. Near the bottom or page 1 of the attached print-out of the reference, it is disclosed that the molecule may be between two electrodes. The band gap change is attributed to tunneling in an electric field.

The IBM Tech. Discl. Bull. is silent with respect to the recited mechanism for change of the band gap.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the molecule used in the invention disclosed by IBM Discl. Bull could have been a molecule with conjugation change because Granstrom teaches that while tunneling is a mechanism for band gap change in an electric field, the use conjugation in molecules leads to greater conductance(paragraph 0055 and 0041).

Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hush et al (JACS 1990 Vol. 112, pp 4192-4197) in view of Granstrom as cited above.

Hush et al discloses field activated intramolecular configurational change in molecules and that the molecules are molecular switches which can be used in logic circuits and therefore can be used in memory devices(page 419s, second paragraph in the first column, and page 4197, first column).

Hush is silent with respect to the recited mechanism for the change in band gap.

It would have been obvious to one of ordinary skill in the art to have used molecules with conjugation such as disclosed by Granstrom in the disclosure made by Hush et al because Granstrom discloses that this increases conductivity.

Allowable Subject Matter

Claims 4-19, and 24-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caridad M. Everhart/
Primary Examiner, Art Unit 2891

2-15-2008